

McChord Pipeline Co.

Leak Detection

CCOPS

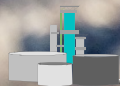
May 8, 2019

Nicholas Peelo

Chief Engineer



Par Pacific



McCHORD PIPELINE CO.



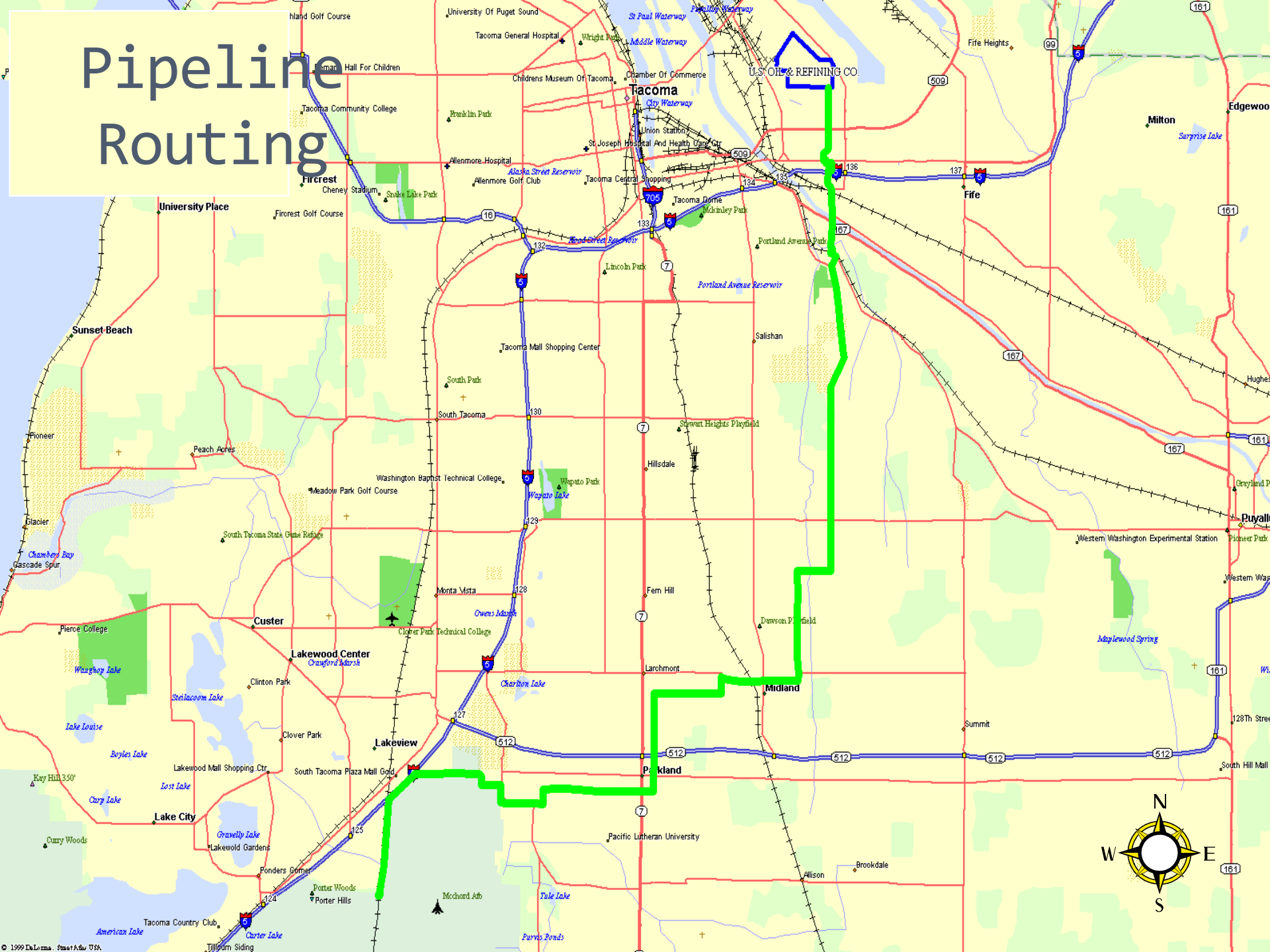
Topics of Discussion

- MPL Facts
- Leak Detection Requirements
- MPL Leak Detection System
- Actual Alarms
- What happens when leak detection is not used correctly?
- Questions

MPL Facts: Pipeline Information

- 14.25 Mile Length, 6" nominal dia., 15 ft above ground between USOR pump station and JBLM
- Dedicated to JP-8 (jet fuel)
- 3 Intermediate Isolation Valves
- Maximum Operating Pressure (MOP) is 720 psig
- Maximum flow rate is 650 bbl/hr (455 gal/min)

Pipeline Routing



Leak Detection Requirements

- Reliable and effective – minimize nuisance alarms and detect actual leaks
- Accurate – MPL flow meters calibrated 2x per year
- Address human factors
 - Operator training is key
 - Initial alarms require operator to look at trends and take action
 - Automatic shutdowns are in place if operator does not take action in time
- Meet regulatory requirements

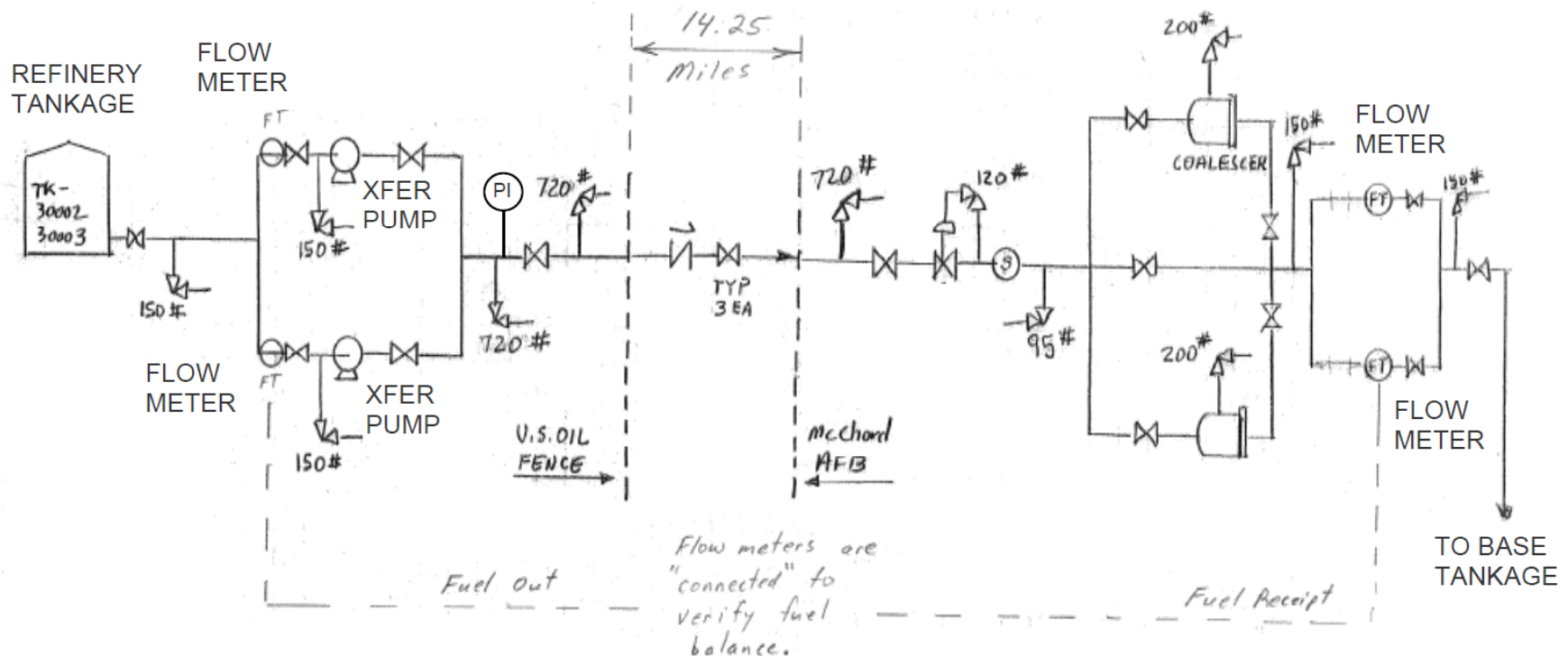
WAC 480-75-300: Leak Detection

- (1) Pipeline companies must rapidly locate leaks from their pipeline. Pipeline companies must provide leak detection under flow and no flow conditions.
- (2) Leak detection systems must be capable of detecting an eight percent of maximum flow leak within fifteen minutes or less.
- (3) Pipeline companies must have a leak detection procedure and a procedure for responding to alarms. The pipeline company must maintain leak detection maintenance and alarm records

Simplified Schematic

Leak detection at flow condition – volumetric balance using flow meters on each end of the transfer

Leak detection at no flow condition – pipeline is pressurized and will alarm with pressure drops



Pumping rate = 650 bbl/hr = 455 gal/min

8% of max flow leak in 15 mins = 455 gal/min * 15 min * .08 = 546 gal <----- FQI-1438 set point

MPL Operations Manual has a section on "Abnormal Operations" which covers responding to alarms

MCCHORD OVERVIEW

COMMON PIPELINE

FQI-1436 JET FLOW DIFFERENCE	85.3	ALM +/- 2000 GAL
PI-1407A LINE PRESSURE LOSS	-0.2	
FI-1420A USO FLOW RATE	646.5	
FQR-1420 TOTALIZER RESET	ON	
A AI-1437 JET GRAVITY	45.1	
FQI-1438 15 MIN GAL DIFF USOR-AFB	23.0	ALM +/- 546 GAL

USO

PI-1407 USO P/L PRESS.	419.0
SA-1411 MCCHORD SHUTDOWN	NORMAL
SDH-1403 P-1401A SHUTDOWN	DOWN
SDH-1404 P-1401B SHUTDOWN	NORMAL
PAL-1405 USO P/L LOW PRESS.	NORMAL
PAH-1406 USO P/L HI PRESS.	NORMAL
VAH-1413 P-1401A VIB.	NORMAL
VAH-1414 P-1401B VIB.	NORMAL
CT-1415 V-1401 ADDITIVE	NORMAL
CT-1416 V-1402 ADDITIVE	NORMAL
CT-1417 V-1403 ADDITIVE	NORMAL
PAH-1418 P-1401A DISCH.	NORMAL
PAH-1419 P-1401B DISCH.	NORMAL
TI-1423 USO JET TEMP.	80.8
FQI-1420 USO TOTAL	24789
FQI-1420C USO CORR. TOTAL	24522
PI-1407R USOR LINE PRES-- LOW	NORMAL

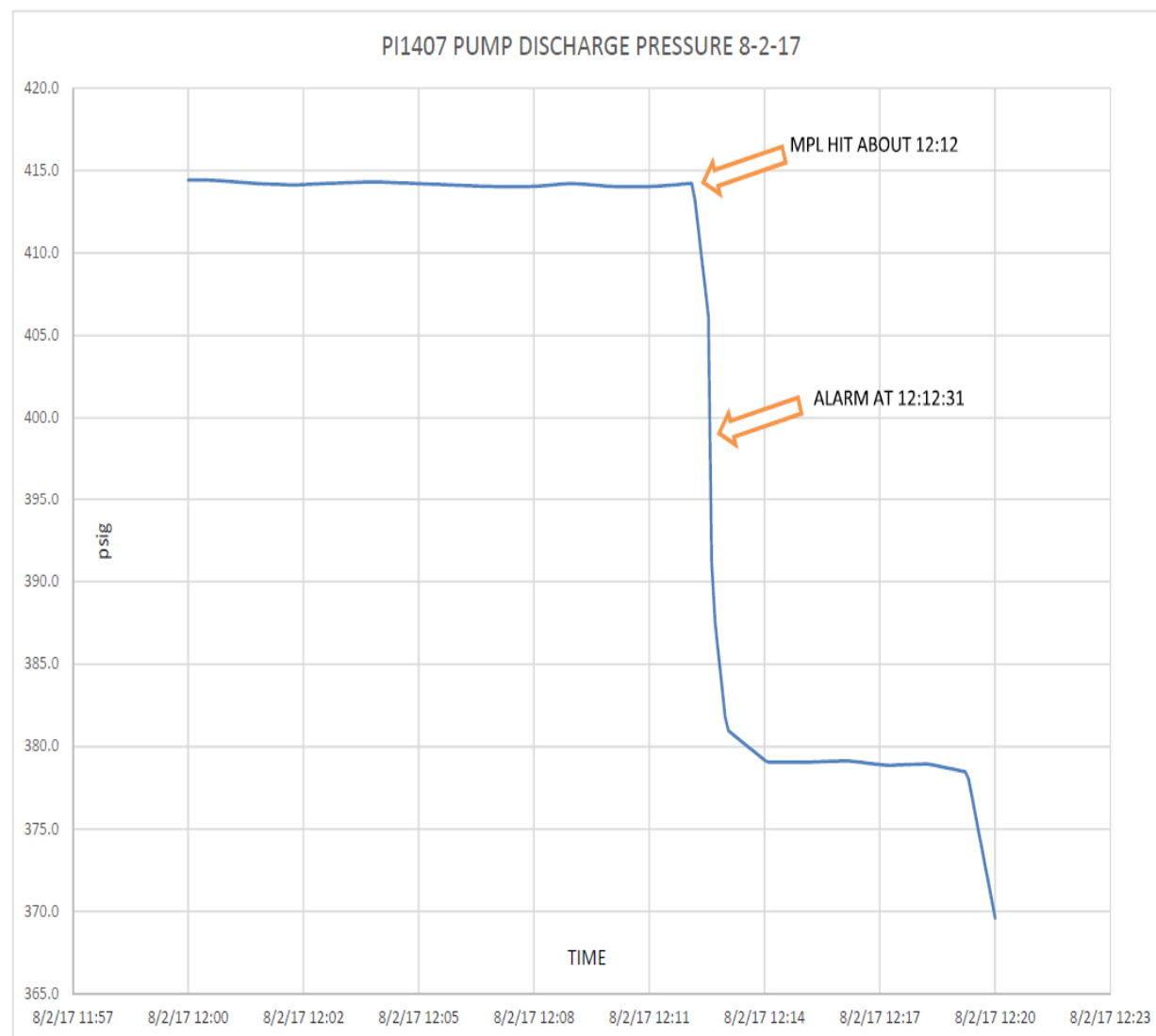
AFB

PI-1425 AFB METER PRESS.	17.3
PI-1426 AFB P/L PRESS.	31.1
FQI-1433C AFB CORR. TOTAL	24620
TI-1424 AFB JET TEMP.	69.6
LAH-1430 AFB SUMP HI	NORMAL
LAHH-1431 AFB SUMP HI HI	NORMAL
CT-1432 AFB COMMUNICATION	NORMAL
CT-1434 AFB INST PANEL CT	NORMAL
CT-1439 AFB UTILITY POWER	NORMAL

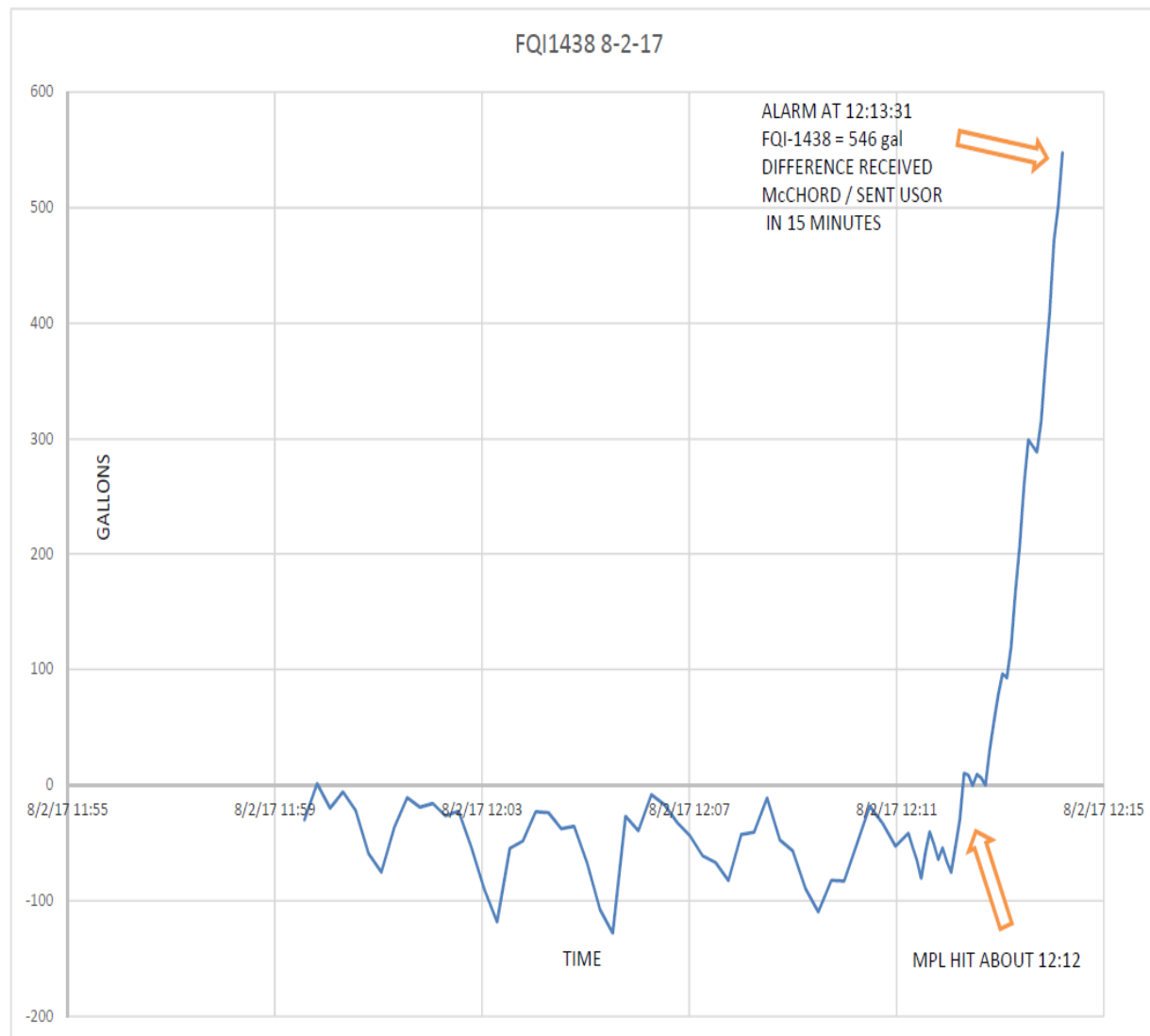
How does the Operator determine there is a leak? By looking at trends:

- **PI-1407**, pump discharge pressure, compares current value to 15 minute average (alarms at 15 psi difference)
- **FQI-1438**, flow totalizer that compares the volume shipped by USOR to the volume received by JBLM over a 15 minute interval (alarms at 546 gallons difference)
- **FQI-1436**, flow totalizer that compares the volume shipped by USOR to the volume received by JBLM (alarms at 2000 gallons difference)

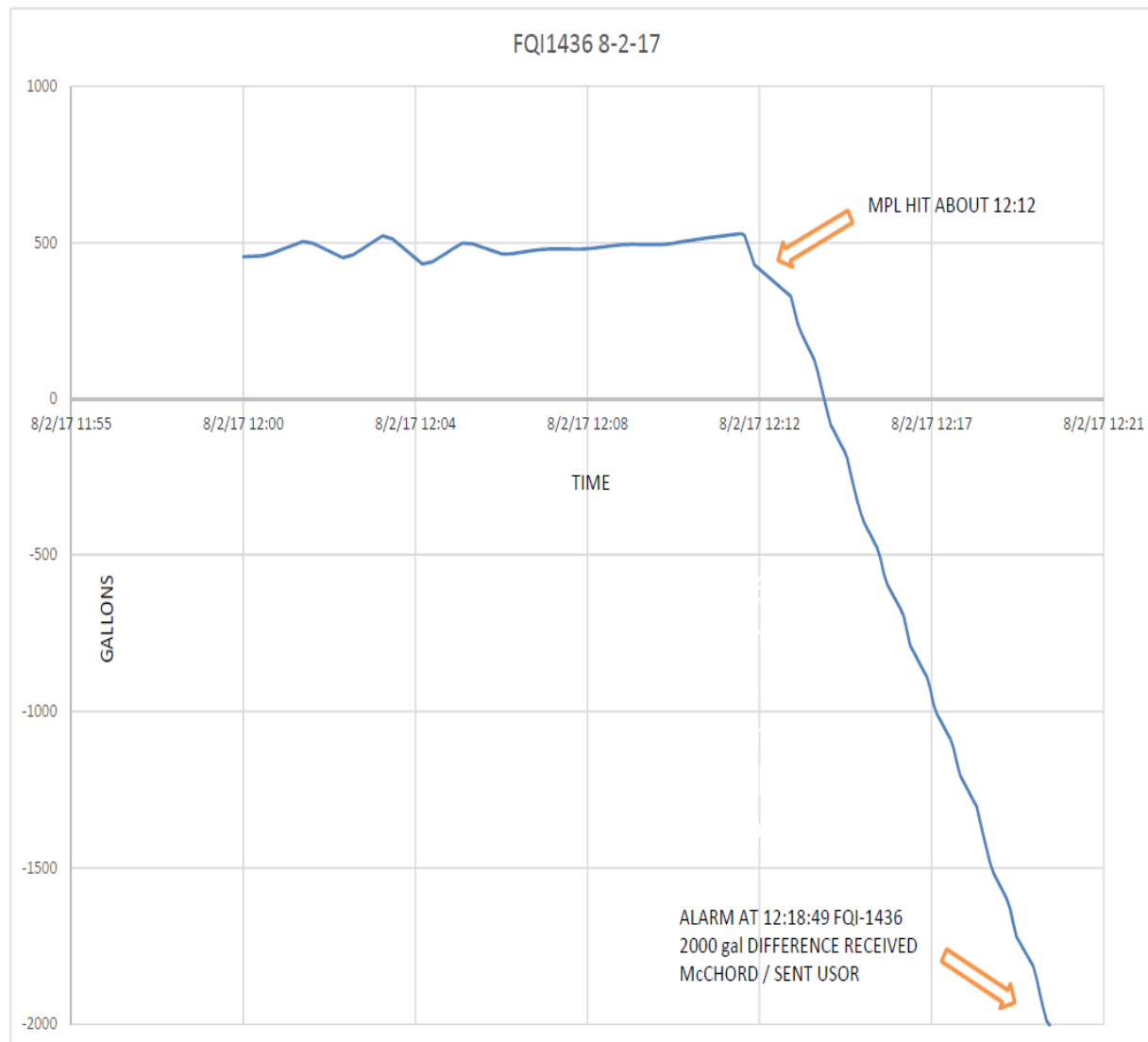
PI-1407



FQI-1438



FQI-1436



What happens when leak detection is not used correctly?

[Pipeline company fined for oil spill in Santa Barbara County \(AP\)](#)

Associated Press

Published 12:13 pm PDT, Friday, April 26, 2019

SANTA BARBARA — A pipeline company has been fined nearly \$3.35 million for causing the worst California coastal spill in 25 years.

A judge issued a fine and penalties Thursday against Plains All American Pipeline for a 2015 spill that sent 140,000 gallons of crude oil gushing onto Refugio State Beach in Santa Barbara County, northwest of Los Angeles. The spill from a corroded pipeline blackened popular beaches for miles, killed wildlife and hurt tourism and fishing.

Federal inspectors found that Plains had made several preventable errors, failed to quickly detect the pipeline rupture and responded too slowly as oil flowed toward the ocean.

Plains operators working from a Texas control room more than 1,000 miles away had turned off an alarm that would have signaled a leak and, unaware a spill had occurred, restarted the hemorrhaging line after it had shut down, which only made matters worse, inspectors found.

Last year, a jury found the Houston company guilty of a felony count of failing to properly maintain its pipeline and eight misdemeanor charges, including killing marine mammals and protected sea birds.

Plains apologized for the spill and paid for the cleanup. The company's 2017 annual report estimated costs from the spill at \$335 million, not including lost revenues.

The fine was well short of the more than \$1 billion in penalties prosecutors had sought. However, additional damages could be levied at a July restitution hearing.

"We take our responsibility to safely deliver energy resources very seriously, and we are committed to doing the right thing," the company said in a statement.

Questions?

